A Model for Meaningful Research Collaborations: The NASA Science and Technology Institute for Minority Institutions

(NSTI)





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United Negro College Fund Special Programs Corporation

NASA Science and Technology Institute

PRESENTATION OVERVIEW

- UNCFSP Overview
- Linkages to National STEM Priorities
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UNCF SPECIAL PROGRAMS

- Spin-off of the United Negro College Fund (UNCF)
- Established in 2000 as an independent 501(c)3 non-profit organization
- Address educational issues that impact minority institutions and underrepresented populations in the following areas:
  - Capacity Building
  - Workforce Development
  - Training and Technical Assistance

UNCF SPECIAL PROGRAMS

Our Mission

Serving as THE PORTAL between the vision of minority institutions and the funding priorities of our nation



NATIONAL STEM PRIORITIES

Restore Integrity to U.S. Science Policy

Expand Investment in Research and Development

Make a National Commitment to Education

Create an Environment that will Foster Private Sector Innovation

Harness Science and Technology to Address 21st Century Challenges

(BARACK OBAMA AND JOE BIDEN'S PLAN FOR SCIENCE AND INNOVATION - 2008)

Enhance our nation's educational, scientific and technological capacity

Enhance needed basic research and development in aeronautics, science and technology

Advance space exploration, reduce the costs of access to space and further push the boundaries of what we can achieve as a nation

(Statement of Charles Bolden, Committee on Commerce, Science & Transportation, U.S. Senate – July 2009)

Link MI institutions, industry, non-profits, and other entities through close association and alignment of research interests and expertise

Channel R&D efforts toward the development of market-based concepts

Provide professional development, including research, business acumen, and leadership skills building expertise that will prepare faculty and, students, to be highly-skilled science and technology leaders

NSTI OVERVIEW

The NSTI is a NASA-Funded Cooperative Agreement established in 2006 and housed within the NASA Ames Research Park in Moffett Field, CA

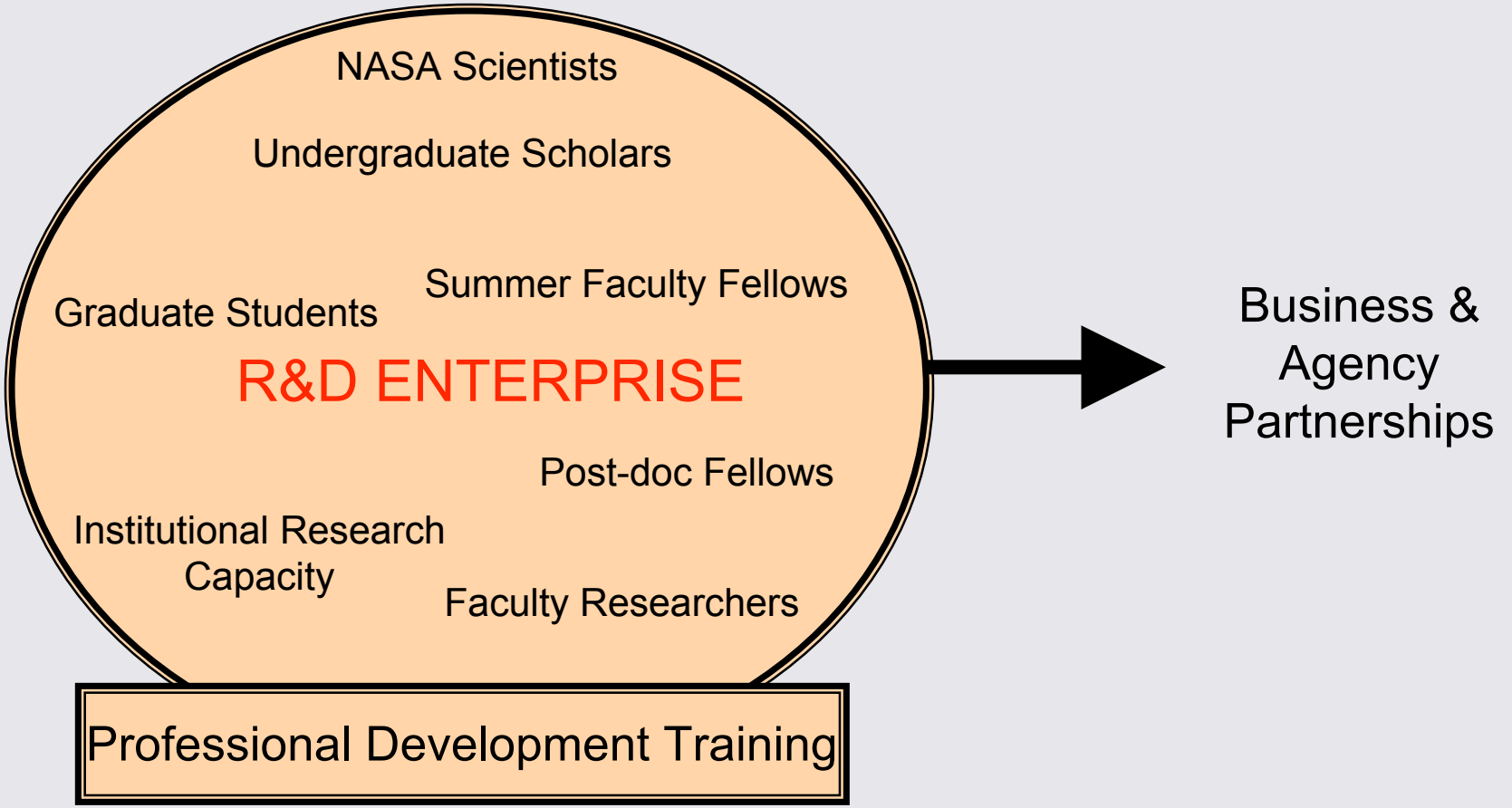
PROJECT GOALS

Create a research consortium that connects the intellectual talent at minority institutions with the Federal government, private industry, nonprofits and others

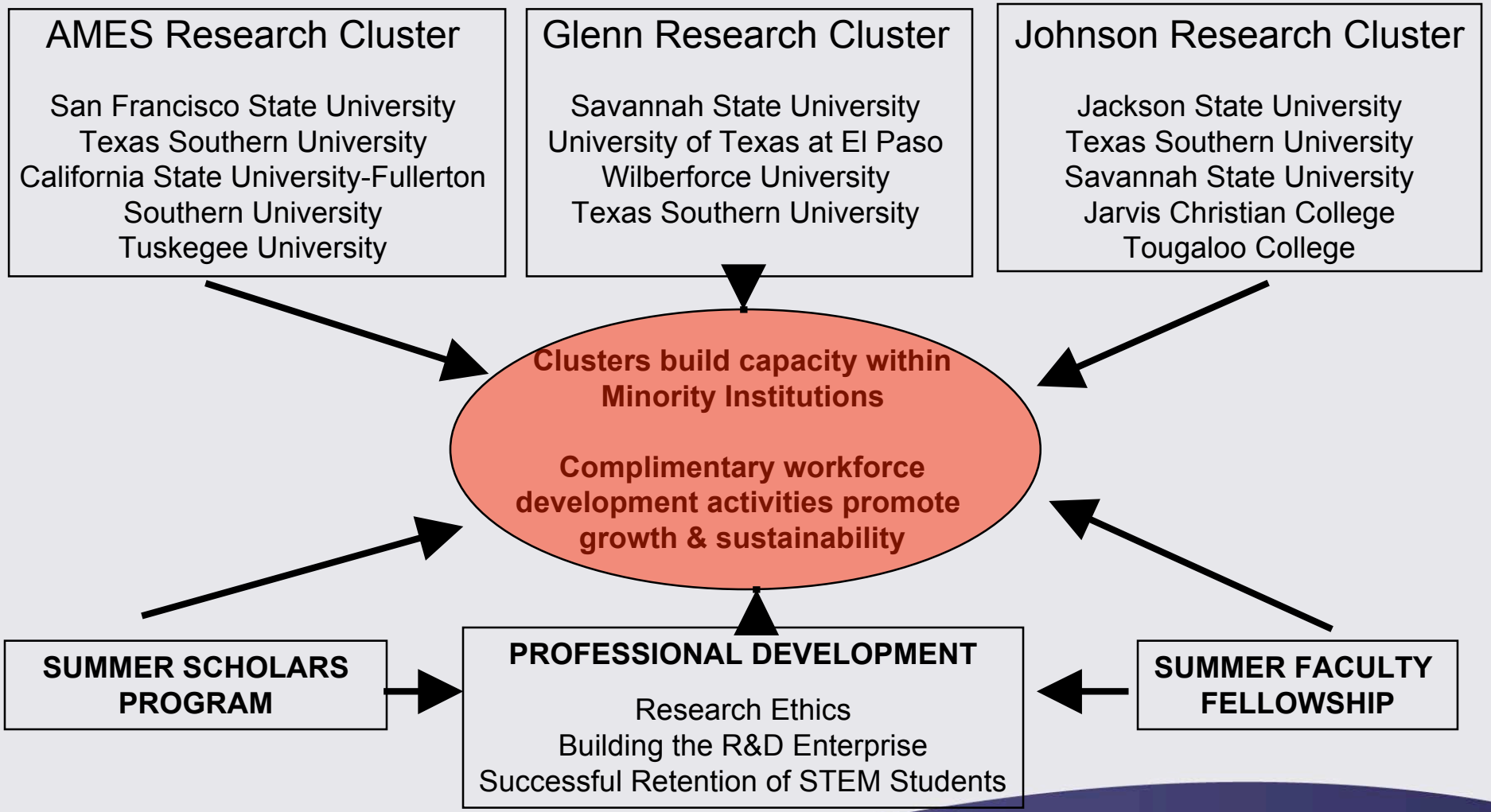
Channel efforts into a Research & Development Enterprise

Provide professional development training in building a R&D Enterprise, including contract and project management, technology transfer, etc.

PROJECT MODEL



PROJECT SCHEMA



RESEARCH CLUSTERS/TRUSTS

The research clusters/trusts complete R&D tasks as teams composed of faculty and students from minority institutions, NASA, partnering majority institutions, consulting technologists, other government and private industry organizations.

RESEARCH CLUSTERS/TRUSTS

Three (3) current Research Trusts; Eleven (11) participating institutions; Six (6) additional Cluster/Trusts planned over the next 3 years

Research Consortia composed of Faculty and Students from MIs, NASA and UNCFSP

Trust Research Themes include:

- Supercomputing and Networking Thermal
- Protection Systems Biotechnology
- Astrobiology and Human Factors
- Energy and Environment
- Space Travel

RESEARCH TRUST AT AMES RESEARCH CENTER

INFORMATION AND EMERGING TECHNOLOGIES

* Networking & intelligent/adaptive systems * Supercomputing
* Nano-scale science & technology * Space exploration
* Air Traffic Management * Thermal protection systems

Accomplishments Include:

✓Fourteen (14) students have conducted research in the areas aligned with NASA GRC.

✓A total of four STEM courses (3 new, 1 revised) are being offered with NASA content in the areas of Marine Science, Engineering Technology, and Innovation

RESEARCH TRUST AT JOHNSON SPACE CENTER

MISSION-ENABLING RESEARCH

* Science missions and payloads
* Astrobiology
* Advanced life support
* Biotechnology
* Human factors
* Bio-nano-info fusion

Accomplishments Include:

✓Thirteen (13) students have conducted research in the areas directly aligned with NASA JSC Core Competencies.

✓Three (3) STEM courses have been revised to include NASA content in Bioinformatics and Environmental Toxicology.

RESEARCH TRUST AT GLENN RESEARCH CENTER

ENERGY AND ENVIRONMENTAL STUDIES

* Alternative and renewable energy sources
* Energy management in space exploration
* Improving human habitation environment on Earth & Space

Accomplishments Include:

✓Two (2) STEM courses revised to include NASA-related subject areas within Information Technology and System Analysis.

✓Cluster faculty facilitated both formal (28) and informal (95) mentoring activities on their campuses.

RESEARCH CLUSTERS/TRUSTS

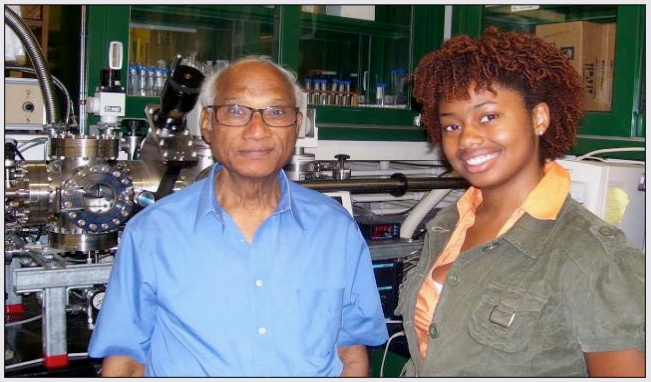
THE BENEFIT OF ESTABLISHING & PARTICIPATING IN A RESEARCH CLUSTER/TRUST

The NSTI provides an opportunity for MI scientists and researchers, including faculty, post-docs and students, to form multi-institutional teams that engage in collaborative research with NASA, other government agencies, industry partners, majority institutions and other minority institutions.

The resulting new research capacity will enable MIs to increase R&D efforts, garner additional funding, and use the research to augment courses in the STEM disciplines.

RESEARCH EXPERIENCES

Summer Scholars Program
Faculty Fellowship Program

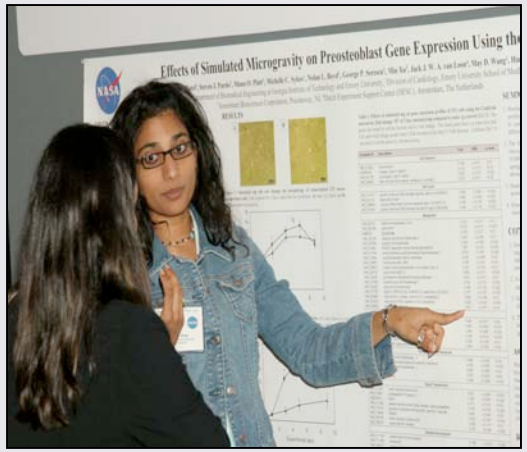


- 10 week research and training-based summer opportunities for underrepresented students and faculty
- 58 undergraduate and graduate Scholars to date amongst 3 Centers
- Over 25% of Scholars have pipelined into other NASA Education projects
- Faculty Fellowship Program instituted in Summer 2009 at NASA Ames with 7 faculty from MIs across the nation

OVERALL NSTI ACCOMPLISHMENTS

- Research Publications in peer-reviewed journals
- National & International Conference Attendance by both undergraduates and graduate students
- Over 7 new or revised STEM courses at MIs
- Continued Pipelining of Participants in NASA Education and Workforce Opportunities
- The establishment of Mentor/Mentee relationships between NASA scientists, students and faculty
- Expanded Professional Development Training Curriculum to provide both online and on site courses

CONCLUSION



Collectively, these components serve as the ideal model for creating a mechanism of advancement for faculty, students, and other professionals that yield mission-driven research, a strengthened STEM workforce, and the foundation for sustained STEM workforce development.

UNCFSP in partnership with NASA, consistently works to ensure that the NSTI continues to evolve into a foundational mechanism for NASA's engagement of MIs, faculty, and underrepresented minority students.

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